

Terms of Reference Consultancy Services

Assignment Bio-Digester Users' Survey (Bus-2024)

National Biogas Programme of Ethiopia

September, 2024 Addis Ababa, Ethiopia

Table of Contents

Li	st of A	Acronyms used in the ToR:	2
1.	Intr	roduction	3
	1.1.	Background	3
	1.2.	General Objective: Error	Bookmark not defined.
2.	Bio	o-digester Users' Survey	5
	2.1.	NBPE Bio-digester Users' Survey (BUS)	5
	2.2.	Objectives of the Assessment	6
3.	Sco	ope of Work	7
3.2	1. I	Data Collection Tools and sample size	7
	3.2.	Approach and Methodology	8
4.	Exp	pected Outputs and Deliverables	9
5.	Tas	sks and Responsibilities	10
6.	Tin	meframe & Cost of Assignment:	10
	6.1. T	Fimeframe	10
	6.2. C	Cost of Assignment:	11
7.	Pre	erequisites for Bid Application	11
8.	Crit	iteria for Proposal Evaluation	11
	8.1. P	Proposal seeking	12
9.	Cos	st of Services and Payment Schedule	13

List of Acronyms used in the ToR:

ASS:	After-Sales Service						
BCE:	Bio-digester Construction Enterprise						
BoANR:	Bureau of Agriculture and Natural Resource Management						
BoFED:	Bureau of Finance & Economic Development						
BSD:	Black-cotton Soil Digester						
BUS:	Bio-digester Users' Survey						
CDM :	Clean Development Mechanism						
CSC:	Customer Support Centre						
DA:	Development Agent						
DBE:	Development Bank of Ethiopia						
EDC:	Entrepreneurship Development Centre						
EU:	European Union						
EUD:	European Union Delegation to Ethiopia						
FDRE:	Federal Democratic Republic of Ethiopia						
GHG:	Greenhouse Gas						
IS:	Implementation Support						
LPG:	Liquid Petroleum Gas						
MoA:	Ministry of Agriculture						
MoF:	Ministry of Finance						
MoWE:	Ministry of Water and Energy						
MEA:	Mines and Energy Agency						
MFI	Micro-Finance Institution						
MTR:	Mid Term Review						
NBPE:	National Biogas Programme of Ethiopia						
NBPCU:	National Biogas Programme Coordination Unit						
NBPE+:	Biogas Dissemination Scale-Up Programme						
PM	Programme Management						
PoA:	Programme of Activities, a term used in carbon finance						
PSD:	Private Sector Development						
QA	Quality Assurance						
RBPCU:	Regional Biogas Programme Coordination Unit						
SNNPR:	Southern Nations, Nationalities & Peoples Region						
SSD:	Solid State Digester						
TA:	Technical Assistance						
TEA:	Talking Energy Ahead, a regular dialogue forum on energy						
ToR:	Terms of Reference						

ToR for Bio-digester Users' Survey (BUS)

Introduction Background

The National Biogas Programme of Ethiopia (NBPE) has been active since 2009, initially launched in Amhara, Oromia, SNNPR, and Tigray regions, and currently expanded to eleven regions, which included Afar, B/Gumuz, Gambella, Somalia, Central Ethiopia, Southern Ethiopia and Sidama regions. The first two phases (NBPE I & NBPE II) were funded by DGIS and the Ethiopian government, while the subsequent Biogas Dissemination Scale-Up Programme (NBPE+) was supported by the European Union (EU) and the Ethiopian government.

The Ministry of Water and Energy (MoWE) oversees the program, working with regional energy bureaus, woreda energy offices, and the private sector. Within MoWE, the National Biogas Programme Coordination Unit (NBPCU) manages the overall program, while eleven Regional Biogas Programme Coordination Units (RBPCUs) handle implementation in their respective areas, focusing on quality assurance, technical assistance, and support.

The Program abled to install about 46,160 household biodigesters until the end of 2023 in all programme implementation regions with different installation and use potentials and efficiencies.



1.2. Household Size Bio-digester Installation

Fig1: Bio-digester Installation Trend in Ethiopia



Fig 2: bio-digester installations by region

A total of 46,160 household size bio-digesters are constructed till end of December 2023 under the programmes, in eleven regions of Ethiopia. The market is gradually developing, though private sector development is still in an infant stage which needs strong support at all levels.

NBPE Registered in the Clean Development Mechanism (CDM) under Ethiopia clean cooking Programme of activities. Accordingly, a carbon finance scheme has been developed by MoWE and the Development Bank of Ethiopia (DBE) under the Clean Development Mechanism (CDM) with support from the World Bank's Clean Initiative for Development (CI-Dev). Registration of a CDM Programme-of-Activities (PoA) with the CDM Executive Board was completed on June 17, 2016. With this achievement, all bio-digesters installed under NBPE II and NBPE+ from January 2015 to 2025 earn carbon credit from April 1, 2016, and The World Bank's Ci-Dev purchases the credits in a good rate, to benefit the programme and the country through carbon finance. CDM is an established market mechanism for carbon trading under the United Nations Framework Convention on Climate Change (UNFCCC).

A CDM PoA must go through an annual process called Monitoring, Reporting and Verification (MRV) for quantification of the carbon credit generated by the bio-digesters. The process starts with Monitoring (M), followed by Reporting (R) and Verification (V), the last one to be done by a UNFCCC CDM Executive Board accredited environment auditor called Designated Operating Entity (DOE).

2. Bio-digester Users' Survey

2.1. NBPE Bio-digester Users' Survey (BUS)

A periodic Bio-digester Users' Survey (BUS) is to be conducted to assess the socio-economic and environmental impacts of the programme as well as other parameters to measure the effectiveness of the programme. It is to be undertaken by a third-party consulting firm with a random sampling of households and conducting door-to-door users' survey using a structured set of questionnaires. The survey will be supported through qualitative information from selected FGD and KII. These impact and programme parameters are assessed, mainly through the survey as experienced or perceived by the users and how they evaluate the programme interventions such as awareness raising, contracting, construction, quality assurance, trainings, and after-sales services, indicating general customer satisfaction with the technology.

The following are major expected benefits of the bio-digesters that are expected to be assessed in BUS 2024:

- 1) Improved health and living conditions in rural households, particularly of women and children.
- 2) Reduction of biomass use for cooking and the time to collect it
- 3) Lighting up the homestead allowing social activities in the evening hours including increased study time, where electricity is not available for lighting
- 4) Improved income of the users
- 5) Improved sanitation and hygiene of the families of the users
- 6) Improved soil fertility and agricultural production
- 7) Reduction of greenhouse gas emission; and
- 8) Creation of new jobs and a new biogas business sector (contractors, masons, and all kinds of input supply).

The BUS serves the following purposes:

- 1) A basis for monitoring and evaluation of the effects of biogas and bio-slurry uses on households as it provides benchmark data on potential bio-digester users, on the expected benefits, as outlined above.
- 2) A basis to provide regular feedback for necessary improvements or review of the programme or its approaches and activities. The feedback will be used to improve or take

corrective measures of the systems and structures as well as approaches and activities at all levels of the programme's public sector support chain and private sector supply chain.

3) The survey is used to establish the woody biomass usage per household as per the guidelines of the Clean Development Mechanism's small-scale approved methodology AMS – latest version, referenced by the methodology to determine average woody biomass use per bio-digester household.

2.2. Objectives of the Assessment

The assignment is a Bio-digester Users' Survey (BUS) of National Biogas Programme of Ethiopia (NBPE) for assessing the socio-economic and environmental impacts of the programme and providing feedback to the programme stakeholders as well as for the monitoring and reporting purpose under CDM PoA.

Specific objectives of the assignment are:

- a) <u>Bio-digester functionality assessment</u> determine proportion of the bio-digester systems that are functional with various degree and the reasons of non-functionality. In this regard, two sets of functionality rate will be worked out. The one is the overall functionality of NBPE as a programme and while the other is the specific NBPE+ functionality (in this regard, the consultant is expected to use the programme functionality definition set by the programme).
- b) <u>Socio-economic impacts assessment</u> 1) assessment of benefits and effects of biogas and bioslurry on male and female headed households, including on health, time saving, socialisation, education, saving or income generation, etc. 2) extent in improvement in health outcomes: reduced incidence of respiratory/eye and other diseases related to fuels, 3) extent in increase in crop yield and income or decreased cost from use and sale of bio-slurry; 4) extent in workload reduction, mostly for women & children, in terms of hours of time saved per day; 5) the extent of pay-back period of the investment and 5) number of direct employment generated (and percentage of total jobs generated for women).
- c) <u>Local and global environmental impacts assessment</u> -1) extent in reduction in deforestation, in terms of reduced annual use of woody biomass or firewood. For this, establish an annual average use of woody biomass before and after the installation of bio-digesters, and hence determine the reduction in use of the woody biomass. This will form the basis for calculation of reduction of Greenhouse Gas (GHG) emissions.
- d) Other Programme performances and parameters assessment 1) ratio of households installing bio-digester with credit from MFIs/cooperatives; and 2) ratio of female headed and other disadvantaged households owning bio-digesters with or without credit from MFIs/cooperatives; 3) extent of after-sales-service provision; 4) extent of users' overall

satisfaction from the programme; 5) if not satisfied, what are the issues (user training and aftersales service, user-friendliness of the technology, behaviours of the public sector and private sector actors, etc.)?; 6) percentage of bio-digesters with two bio-slurry pits and 7)extent of support the users received from whom (Mason, woreda technicians or whom). These feedbacks are to improve the programme approach, strategies, digester designs, programme tools and techniques, etc.

3. Scope of Work

The survey covers households with bio-digesters installed by the national biogas Programme of Ethiopia in five regions as a sample. These are Amhara, Oromia, Somali, B/Gumuz, Sidama regions. The full description is available in the sample size and sampling section.

3.1. Data Collection Tools and sample size

- The survey sample size will be sufficient in number to have a confidence level of at least 90% with a minimum precision of 10%. The households to be surveyed will be selected on a random sample basis. The survey wills only cover households with bio-digesters installed from January 2015 to December 2023. The minimum total sample size is 200 households.
- 2) The research questions are to be guided by the assumption that installation of bio-digesters will lead to changes in the spheres of energy use, agriculture, health, sanitation, gender relations, environment, and overall living conditions of rural households, particularly for women and children.
- 3) To this extent, a standard BUS questionnaire will be developed and utilized by the enumerators to interview the biogas digester users in the field. The questionnaire developed and used for BUS 2019 will be used for further fine-tuning in view of, inter alia, practicality and appropriateness of formulation. The questionnaire will be structured and sequenced in a logical manner, for ease of analysis and reporting.
- 4) A database will be developed with the data on the responses of the standardised questionnaire. Data collection may be done through a Mobile Apps, to improve the credibility of the survey and the data management process. A colour photo of the bio-digester and the owner will be part of the report. If the Mobile Apps option is not possible due to valid reasons, hard copies of questionnaire will be used.

3.2. Approach and Methodology

- a) **Desk Review**: After the contract is awarded, the researchers will conduct a desk study of relevant program documents, information on biogas and animal husbandry in the country, and prior surveys using a similar approach.
- **b) Data Collection Instruments Design**: The researchers will create data collection instruments (questionnaires, checklists, observation sheets) for interviews, focus group discussions, and key informant interviews, starting in English. They will check these tools for appropriateness, considering respondent profiles, interests, availability, and bias minimization, particularly for the questionnaire. Responses often aim to avoid embarrassment, so care is needed. The instruments will be shared with the MoWE/NBPCU team for feedback. Following revisions, they will be translated from English to Amharic.

Once finalized, a survey instance will be set up in the MoWE/NBPCU online app (LogAlto) to manage all data processes. The lead consultant or a delegate will have app access during the survey.

- c) Data Collection and Survey Training: The researcher will test draft tools in at least 10 households with key team members and MoWE/NBPCU staff. Before the survey, intensive training will be conducted for enumerator team members, including female enumerators proposed by the consultant. Field testing will also serve as training for enumerators, who must speak local languages (e.g., Amharic, Oromifa).
- d) Sample Size and Sampling: Only households with biodigesters will be surveyed, targeting a minimum sample of 200 across at least 16 woredas from five regions (Amhara, Oromia, Sidama, Afar, and B/Gumuz). MoWE/NBPCU will provide a complete list of bio digester households. The consultant will employ multi-tier random sampling to ensure regional representation while maintaining homogeneity in household characteristics and bio digester specifics.
- e) Data Collection: To accurately capture gender perspectives and encourage women to share their views, the field survey will include both genders, with women interviewed in comfortable settings. Data will be recorded through the MoWE/NBPCU online system (LogAlto) and complemented by five focus group discussions and interviews with key stakeholders. Only household members aged 18 and above will be interviewed, focusing on those knowledgeable about the bio digester. A color photo of each interviewed household, showing the respondent and the bio digester, is mandatory, with consent obtained prior to photography. No telephone interviews will be conducted.

4. Expected Outputs and Deliverables

The consultant will produce an inception report that includes the travel plan, work schedule, overall study plan, questionnaires, data entry and reporting templates, and other data collection tools, all of which must be approved by MoWE/NBPCU. Additionally, the consultant will train enumerators and facilitate data collection in the field.

The consultant will verify the BUS data gathered from the field survey and input it into the online app system (LogAlto) for processing. A draft report for discussion will be prepared and submitted electronically to MoWE/NBPCU. This report will be shared at least one week in advance, followed by a PowerPoint presentation to relevant NBPC staff (MoWE & NBPCU) and other stakeholders in Addis Ababa, organized by MoWE/NBPCU.

After receiving comments, the consultant will finalize and edit the report in British English before submission. The final report will include:

- An executive summary with key findings and observations
- An outline of the approach and methodology
- Findings organized by identified research questions, utilizing charts, graphics, and photographs
- An assessment of the social acceptability of biogas technology users and non-users, along with their willingness to install and use the technology, including underlying reasons
- A report on the percentage of functional bio-digester systems, categorizing reasons for nonfunctionality into serious technical issues, simple repairs, water shortages, and livestockrelated factors
- An average value for woody biomass usage among households with biogas systems (kg/day or tonnes/year)
- Recommendations for NBPE

Annexes will include:

- 1. Data collection instruments
- 2. Description of sampling methods and selected samples
- 3. Color photos and GPS readings of the respondents
- 4. List of additional respondents for focus group discussions, etc.

The final report will be organized into well-defined chapters or sections, featuring tables, color charts, and photographs. It will be clearly written in British English, using Verdana font, size 11, with line spacing of 1.15, and will not exceed 35 pages, excluding annexes. The database will be submitted separately to the MoWE/NBPCU data platform. The final report will be delivered in three hard copies and electronic format to MoWE/NBPCU.

5. Tasks and Responsibilities

- The consultant will oversee all activities required to complete the assignment, including designing the questionnaire, selecting and training enumerators, data collection, analysis, and reporting.
- MoWE will support this process, particularly by coordinating with national and regional program units to provide necessary information and guidance for the survey's design and execution.
- MoWE/NBPCU will provide an Excel sheet with the user database for the specified years, along with the NBPE+ program document, interim narrative reports, and previous BUS reports as primary reference materials.
- MoWE/NBPCU will grant the consultant access to the online data collection platform LogAlto for confidential use by the lead consultant or a designated delegate.
- The consultant is responsible for preparing a draft report and presentation for NBPE staff at the MoWE office in Addis Ababa on an agreed date following the completion of the draft report. Once approved, the final report will be submitted in soft copy to NBPCU.

6. Timeframe & Cost of Assignment:

6.1. Timeframe:

The assignment will last a maximum of 45 consulting person-days for three professionals, with the team leader contributing at least 50% of total days. The specific number of field numerator days will be defined in the proposal. The assignment will be completed within two months of contract signing, culminating in the submission of a final report in MS Word, including the database, once approved by MoWE/NBPCU.

6.2. Cost of Assignment:

The payment schedule will follow the structure outlined in the accompanying table.

Instalment s	Per cent	Total Amt., Birr	Due Date	Expected Output
1st instalment	30%			Upon submission of inception report and written payment request
2nd instalment	50%			Upon draft report followed by a PowerPoint presentation and written payment request
Final payment	balance			FinaldeliverablesacceptedbyMoWE/NBPCU and written payment request(Task completed).

7. Prerequisites for Bid Application

Interested applicants must fulfill the following prerequisites; those that do not will not be evaluated:

- Be a legally registered consulting firm in Ethiopia with at least 5 years of operation, verified by audit or tax clearance reports.
- Hold a renewed license.
- Have completed at least 5 similar consulting assignments in Ethiopia.

Team members must meet the qualifications and experience specified in the 'Team Composition' section.

8. Criteria for Proposal Evaluation

Proposals will be evaluated based on the following criteria:

- Technical Evaluation Criteria (70% Technical, 30% Financial)
- Proposals will be assessed against predefined technical criteria, requiring a minimum score of 50% (35 out of 70) for qualification.
- Financial Evaluation Criteria (30% Weightage)

The minimum bidder will receive 30%, while other proposals will be evaluated on a pro-rata basis. Negotiations may be required regarding the scope of work and budget to align with program objectives and budget limitations.

Evaluation criter	ia	Maximu m score	Maximu m score Actual score			
			(name)	(name)	(name)	
Mandatory Criteria	Legal Status (Certificate of registration, TIN no., other)	Y/N				
Understanding of the	Clear conceptual understanding of the Scope of Works	20				
Assignment	Proposed approach and methodologies for the survey	20				
Experience in (key aspects of	Demonstrated years of experience in similar work including	10				
the assignment)	Local presence in project area	20				
	Track record (timeliness of delivery)	10				
	Quality of proposed staff to be involved in the assignment	10				
Capacity to Deliver	Resource availability and proposed use (vehicles, staff team, organisation structure, geographic outreach, other)	10				
Total		100				

8.1. Proposal seeking

Proposals are invited from consultants for competitive bidding, requiring separate technical and financial proposals submitted in two sealed envelopes to MoWE/NBPCU Ethiopia. The technical proposal must include a table that explains and justifies all qualifications (as detailed in the "Pre-Requisites for Application" section) and provide supporting documentation.

Required documents to accompany the technical proposal include:

- Organizational profile
- Team composition with roles and responsibilities
- Updated CVs of team members showcasing their qualifications and experience
- Detailed work activities and schedule
- Valid license

Overall coordination will be managed by the NBPE National Program Manager at MoWE/NBPCU Ethiopia, with the MoWE Energy team and relevant experts collaborating closely with the consultant for technical operationalization.

9. Cost of Services and Payment Schedule

A. Detail of Fee

Remuneration (Personnel	Perso	Unit Rate,	Total	Remarks
Cost)	n-	Birr	Amt.,	
	days		Birr	
a) Team Leader				
b) Technical Expert				
c) Numerators				
Sub Total				
Overhead (x% of subtotal),	in case	of a firm/con	pany and	To cover all indirect costs,
not individual(s).				including communication,
				etc.
Total Fee				

B. Detail of Other Costs

Reimbursable	Unit	Unit Rate, Birr	Total Amt., Birr	Remarks
Per Diem (DSA+ Accommodation)			-	Statement to be submitted.
Travel Expenses (air, taxi, etc.)		1		
Note: add rows, if needed				
Total of Other Costs			-	

C. Total Payment

Particulars		Total Amt., Birr	Remarks
1. Fee		-	
2. Other Costs		-	
3. Sub Total		-	

4. VAT (15%) of C-3.			
		-	
5. Contract Value (C-3 + C-			
4)		-	
4)		-	

D. Payment Schedule

Instalments	Per cent	Total Amt., Birr	Due Date	Expected Output
1st instalment	30.00 %			Upon submission of inception report and written payment request
2nd instalment	50.00 %			Upon draft report followed by a PowerPoint presentation and written payment request
Final payment	balan ce			Final deliverables accepted by MoWE/NBPCU (Task completed).